इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 3500 (1966): Mango Chutney [FAD 10: Processed Fruits and Vegetable Products]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

IS : 3500 - 1966

REAFFIRMED

2005

Indian Standard

SPECIFICATION FOR MANGO CHUTNEY

(Second Reprint DECEMBER 1981)

UDC 664.58:634.441

© *Copyright* 1966

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

May 1966

Indian Standard

SPECIFICATION FOR MANGO CHUTNEY

Fruits and Vegetables Sectional Committee, AFDC 23

Chairman	*Representing*
SHRI R. T. MIRCHANDANI	Directorate of Marketing & Inspection (Ministry of Food & Agriculture), Nagpur
Members	
SENIOR MARKETING OFFICER (FRUIT PRODUCTS) (*Alternate* to Shri R. T. Mirchandani)	
DR B. CHOUDHURY	Indian Agricultural Research Institute, New Delhi
COL A. G. FERNANDES	Army Headquarters, Quartermaster General's Branch (Ministry of Defence)
LT-COL N. G. C. IENGAR (*Alternate*)	
DR T. K. GHOSE	Jadavpur University, Calcutta
HORTICULTURIST	Agriculture Department, Government of Assam
HORTICULTURIST	Agriculture Department, Government of Maharashtra
HORTICULTURIST	Agriculture Department, Government of West Bengal
HORTICULTURIST AND ASSOCIATE PROFESSOR OF HORTICULTURE AGRICULTURAL COLLEGE AND RESEARCH INSTITUTE, COIMBATORE	Agriculture Department, Government of Madras
COL P. C. KHANNA	Technical Standardization Committee, Food Stuffs (Ministry of Food & Agriculture)
DR P. K. KYMAL (*Alternate*)	
DR D. S. PATEL	Pure Products & Madhu Canning Private Limited, Bombay
SHRI K. U. PATEL	Tims Products Ltd, Calcutta
SHRI M. V. PHADNIS	Nagpur Orange Growers' Co-operative Association Ltd, Nagpur
DR G. S. RANDHAWA	Indian Council of Agricultural Research, New Delhi
SHRI U. S. KANG (*Alternate*)	
SHRI B. B. SARDESHPANDE	All India Food Preservers' Association, Bombay
SHRI R. N. GOYLE (*Alternate*)	
SHRI SATWANT SINGH	In personal capacity (*Nasirpur Farm, P.O. Bahadurgarh Fort, Patiala*)
SECRETARY	Development Council for Food Processing Industries (Ministry of Industry & Supply)
DR G. S. SIDDAPPA	Central Food Technological Research Institute (CSIR), Mysore
SHRI H. C. BHATNAGAR (*Alternate*)	
DR D. N. SRIVASTAVA	Directorate of Fruit Utilization, Government of Uttar Pradesh, Ranikhet
SHRI DAYA NAND (*Alternate*)	

(*Continued on page* 2)

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

(*Continued from page* 1)

Members	*Representing*
DR Y. K. SUBRAHMANYAM	Central Committee for Food Standards (Ministry of Health), New Delhi
SHRI L. J. TAYLOR	Hindustan Lever Limited, Bombay
VEGETABLE BOTANIST	Agriculture Department, Government of Punjab
DR D. V. KARMARKAR, Deputy Director General	Director General, ISI (*Ex-officio Member*)

Secretary

SHRI G. S. VILKHU

Deputy Director (Agri & Food), ISI

Processed Fruits and Vegetables Subcommittee, AFDC 23 : 3

Convener	
SHRI K. U. PATEL	Tims Products Ltd, Calcutta
Members	
AGRICULTURAL MARKETING ADVISER TO THE GOVERNMENT OF INDIA	Directorate of Marketing & Inspection (Ministry of Food & Agriculture), Nagpur
SHRI S. C. BHATTACHARJYA (*Alternate*)	
SHRI P. D. BHARGAVA	The Midland Fruit & Vegetable Products (India), Mathura
SHRI M. I. DAVID	The Canning Industries Cochin Limited, Trichur
SHRI C. V. PAUL (*Alternate*)	
COL A. G. FERNANDES	Army Headquarters, Quartermaster General's Branch (Ministry of Defence)
LT-COL N. G. C. IENGAR (*Alternate*)	
DR T. K. GHOSE	Jadavpur University, Calcutta
SHRI GIRDHARI LALL	Provision Merchants Association, Delhi
SHRI E. K. JAYANARAYANAN	Dyer Meakin Breweries Ltd, Ghaziabad
SHRI M. S. KOHLI	Nagpur Orange Growers' Co-operative Association Ltd, Nagpur
DR P. K. KYMAL	Technical Standardization Committee, Food Stuffs (Ministry of Food & Agriculture)
DR D. S. PATEL	Pure Products & Madhu Canning Private Ltd, Bombay
SHRI N. S. POCHKHANWALA	D. & P. Products Private Ltd, Bombay
SHRI L. J. D'SOUZA (*Alternate*)	
SECRETARY	Central Committee for Food Standards (Ministry of Health)
SHRI D. S. CHADHA (*Alternate*)	
SECRETARY	Development Council for Food Processing Industries (Ministry of Industry & Supply)
DR G. S. SIDDAPPA	Central Food Technological Research Institute (CSIR), Mysore
SHRI H. C. BHATNAGAR (*Alternate*)	
SHRI L. J. TAYLOR	Hindustan Lever Limited, Bombay
DR H. C. SRIVASTAVA (*Alternate*)	
DR P. K. VIJAYARAGHAVAN	Research & Development Organisation (Ministry of Defence)
DR T. R. SHARMA (*Alternate*)	

AMENDMENT NO. 1 JUNE 1996
TO
IS 3500 : 1966 SPECIFICATION FOR MANGO CHUTNEY

(*Page* 3, *Foreword, clause* **0.4**) — Insert the following clause after **0.4** and renumber the subsequent clause:

'**0.5** A scheme for labelling environment friendly products known as ECO-Mark has been introduced at the instance of the Ministry of Environment and Forests (MEF), Government of India. The ECO-Mark shall be administered by the Bureau of Indian Standards (BIS) under the *BIS Act*, 1986 as per the Resolution No. 71 dated 20 February 1991 and Resolution No. 425 dated 28 October 1992 published in the Gazette of the Government of India. For a product to be eligible for marking with the ECO-Mark it shall also carry the Standard Mark of BIS for quality besides meeting additional environment friendly (EF) requirements. The environment friendly requirements for mango chutney are, therefore, included through Amendment No. 1 to this standard.

This amendment is based on the Gazette Notification No. 624 (E) dated 6 September 1995 for Labelling Beverages, Infant Foods, Processed Fruits and Vegetable Products as Environment Friendly, published in the Gazette of the Government of India.'

(*Page* 5, *clause* **4.5.4**) — Insert the following new matter after **4.5.4**:

''**4.6 Additional Requirements for ECO-Mark**

4.6.1 *General Requirements*

4.6.1.1 The product shall conform to the requirements prescribed under **4.1** to **4.5.4**.

4.6.1.2 The manufacturer shall produce the consent clearance as per the provisions of *Water (PCP) Act*, 1974, *Water (PCP) Cess Act*, 1977 and *Air (PCP) Act*, 1981 along with the authorization if required under *Environment (Protection) Act*, 1986 and the Rules made thereunder to the Bureau of Indian Standards while applying for the ECO-Mark and the product shall also be in accordance with the *Prevention of Food Adulteration Act*, 1954 and the Rules made thereunder. Additionally, FPO 1955 (Fruit Product Order) framed under *Essential Commodities Act*, 1955, *Standards of Weights and Measures Act*, 1977 requirements wherever applicable has to be complied with.

4.6.1.3 The product/packaging may also display in brief the criteria based on which the product has been labelled environment friendly.

4.6.1.4 The material used for product/packing shall be recyclable or biodegradable.

4.6.1.5 The date of manufacture and date of expiry shall be declared on the product/package by the manufacturer.

4.6.1.6 The product shall be microbiologically safe when tested as per IS 5403 : 1969 'Method for yeast and mould count of foodstuffs' and IS 5887 (Part 5) : 1976 'Methods for detection of bacteria responsible for food poisoning : Part 5 Isolation, identification and enumeration of *Vibrio Cholerae* and *Vibrio Parahaemolyticus* (*first revision*)' and shall be free from bacterial and fungal toxins.

4.6.1.7 The pesticide residues, if any in the product shall not exceed the limit as prescribed in *PFA Act,* 1954 and the Rules made thereunder.

4.6.1.8 The product/package or leaflet accompanying it may display instructions of proper use, storage and transport (including refrigeration temperature compliance) so as to maximize the product performance, safety and minimize wastage.

4.6.2 *Specific Requirements*

4.6.2.1 The product shall not contain any of the heavy metal contaminants in excess of the quantities prescribed in Table 1.''

(*Page* 6, *clause* **5.2**) — Insert the following new clause after **5.2**:

'**5.3 ECO-Mark**

The product may also be marked with the ECO-Mark, the details of which may be obtained from the Bureau of Indian Standards.'

(FAD 10)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR MANGO CHUTNEY

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 3 April 1966, after the draft finalised by the Fruits and Vegetables Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Mango chutney occupies an important place among the traditional foods processed in India, and there is good scope for the development of its external as well as internal trade. It is, however, necessary to ensure the quality of chutney by exercizing strict quality control which may be done on the basis of this Indian Standard.

0.3 This standard is one of a series of Indian Standards on processed fruits and vegetables.

0.4 In the preparation of this standard, due consideration has been given to the provisions of the *Prevention of Food Adulteration Act, 1954* and the Rules framed thereunder, and the *Fruit Products Order, 1955*. However, this standard is subject to the restrictions imposed under these, wherever applicable.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

---

1. SCOPE

1.1 This standard prescribes the requirements and methods of test for mango chutney.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

*Rules for rounding off numerical values (*revised*).

2.1 Absence of Defects — Freedom from extraneous materials, such as stone, scraping and grit.

2.2 Fruit Chutney — A preparation, made from sound fruits with spices, salt, onion, garlic, sugar, jaggery, vinegar or acetic acid; it shall contain not less than 50 percent (by weight) of total soluble solids.

3. GRADES

3.1 Mango chutney shall be of two grades:

Grade 1, and

Grade 2.

4. REQUIREMENTS

4.1 General — Mango chutney shall be prepared from slices obtained by cutting raw peeled mangoes longitudinally. The mangoes used shall be free from insect or fungal attack. The substances that may be added to the chutney are: sugar, acetic acid, citric acid, spices, salt and vinegar. Raw peeled sliced papaya, when added as tenderizing agent to the chutney, shall not exceed 5 percent by weight of the fruit.

4.1.1 In case preserved mango slices are used for the manufacture of chutney, the sulphur dioxide content in the final product shall not exceed 40 ppm.

4.2 Fruit Content — Fruit content in chutney shall be not less than 40 percent by weight when tested according to the method prescribed in Appendix A.

4.3 Preservatives — No preservative other than benzoic acid shall be used in mango chutney. The benzoic acid content shall not exceed 250 ppm when tested according to the method prescribed in Appendix B.

4.4 Extraneous Colouring Matter or Synthetic Sweetening Agents — Mango chutney shall be free from extraneous colouring matter and synthetic sweetening agents.

4.5 Finished Product — The two grades of mango chutney, determined according to the method prescribed in Appendix C, shall display the following characteristics:

Grade 1 — The mango chutney shall possess a good, uniform colour; shall be practically free from defects; shall possess a fleshy texture and normal characteristic taste and flavour; and shall score not less than 85 points.

Grade 2 — The mango chutney shall possess a good, uniform colour; shall be reasonably free from defects; shall possess a

reasonably fleshy texture and normal characteristic taste and flavour; and shall score not less than 75 points.

The maximum and minimum number of points to be scored by different factors shall be as given below. Scoring shall be done according to the method prescribed in Appendix C.

	Maximum	Minimum	
		Grade 1	*Grade 2*
Colour and texture	25	19	16
Taste and flavour	50	37	33
Absence of defects	25	19	16

4.5.1 *Colour and Texture* — The colour and texture of the two grades of mango chutney shall be as follows:

Grade 1 — The chutney shall possess a good, practically uniform colour; shall be practically free from discolouration due to oxidation or other causes. The material shall possess a fleshy texture and shall be practically free from being fibrous.

Grade 2 — The chutney shall possess a good, reasonably uniform colour; shall be reasonably free from discolouration due to oxidation or other causes. The material shall possess a reasonably tender texture and shall be reasonably free from being fibrous.

4.5.2 *Taste and Flavour*

Grade 1 — The chutney shall possess a pleasant aroma and flavour, characteristic of the product. The material shall be devoid of any objectionable or off-taste smell or odour.

Grade 2 — The chutney shall possess a pleasant aroma and flavour, characteristic of the product. The material shall be reasonably free from objectionable, metallic or off-taste smell or odour.

4.5.3 *Absence of Defects*

Grade 1 — The material in this grade shall be practically free from defects, such as stone or scrapings, grit and other extraneous material.

Grade 2 — The material in this grade shall be reasonably free from defects, such as stone or scrapings, grit and other extraneous material.

4.5.4 The material shall also conform to the requirements prescribed in Table 1.

TABLE 1 REQUIREMENTS FOR MANGO CHUTNEY

(*Clause* 4.5.4)

Sl No.	Characteristic	Requirement	Ref to Appendices in this Standard	Methods of Test (Ref Cl No. of IS : 2860-1964*)
(1)	(2)	(3)	(4)	(5)
i)	Total soluble solids (Brix), *Min*	50°	—	9
ii)	Acidity, expressed as acetic acid, percent by weight	0·50-3·0	—	10
iii)	Total ash, percent by weight, *Max*	5·0	D	—
iv)	Acid insoluble ash, percent by weight, *Max*	0·5	E	—
v)	Arsenic, ppm, *Max*	1·1	—	13
vi)	Lead, ppm, *Max*	2·5	—	14
vii)	Copper, ppm, *Max*	30	—	15
viii)	Zinc, ppm, *Max*	19	—	16
ix)	Tin, ppm	250	—	17
x)	Microbiological requirements	To satisfy the requirements of the test	—	18
xi)	Mould count	Not to exceed 40·0 percent of the field examined	—	—

*Methods of sampling and test for processed fruits and vegetables.

5. PACKING AND MARKING

5.1 Packing — Mango chutney may ordinarily be packed in wooden barrels or in glass containers.

5.2 Marking — Each container shall be marked with the following particulars:

a) Name and grade of the material;
b) Name and address of the manufacturer;
c) Net weight of the contents;
d) Date of manufacture or code number indicating the date of manufacture, to be embossed;
e) List of additives, if used; and
f) Manufacturing licence number.

6. SAMPLING

6.1 The method of drawing representative samples of the material and the criteria for conformity shall be as prescribed in 3 of IS : 2860-1964*.

7. TESTS

7.1 The samples of mango chutney shall be tested for ascertaining conformity of the material to the requirements of this specification by the methods given in IS : 2860-1964*. Reference to the relevant clauses of IS : 2860-1964* is given in col 4 of Table 1.

APPENDIX A

(*Clause* 4.2)

DETERMINATION OF THE FRUIT CONTENT

A-1. APPARATUS

A-1.1 IS Sieve (2·00 mm) — Alternatively, BS Sieve 8 or ASTM Sieve 10 or Tyler Sieve 9 may be used as these are equivalent to 2·00-mm IS Sieve (*see* IS : 460-1962†).

A-2. PROCEDURE

A-2.1 Take 50 g of the representative sample in a flask and stir it with 200 ml of boiling water for about two minutes and transfer to a previously weighed IS Sieve (2·00 mm). Allow to drain for two minutes. Weigh the sieve along with the remaining portion and calculate the percentage of fruit content.

APPENDIX B

(*Clause* 4.3)

DETERMINATION OF BENZOIC ACID

B-1. REAGENTS

B-1.1 Saturated Sodium Chloride Solution

B-1.2 Pulverized Sodium Chloride

*Methods of sampling and test for processed fruits and vegetables.
†Specification for test sieves (*revised*).

B-1.3 Calcium Carbonate Solution — 1 : 3 solution of milk of lime.

B-1.4 Dilute Hydrochloric Acid — 1 : 3.

B-1.5 Chloroform

B-1.6 Ethyl Alcohol — made neutral with alkali using phenolphthalein as an indicator.

B-1.7 Phenolphthalein Indicator Solution — prepared by dissolving 0·1 g in 100 ml of rectified spirit (*see* IS : 323-1959*).

B-1.8 Standard Sodium Hydroxide Solution — 0·05 N.

B-2. PROCEDURE

B-2.1 Weigh accurately about 150 g of the material in a suitable digestor and add to it about 300 ml of the saturated sodium chloride solution. Digest the material and then add 15 g of pulverised sodium chloride. Make the solution alkaline to litmus by adding required amount of milk of lime. Transfer the solution to a 500-ml volumetric flask and make up to volume with saturated solution of sodium chloride. Allow it to stand for at least two hours shaking frequently; centrifuge, if necessary, and filter.

B-2.2 Pipette accurately 100 to 200 ml of the filtrate (**B-2.1**) into a separating funnel. Neutralize it to the litmus with hydrochloric acid and add 5 ml in excess. Extract with 70, 50, 40 and 30 ml of chloroform, shaking with a rotary motion to avoid an emulsion. If an emulsion forms, break it up with a glass rod, by drawing off into a second funnel and giving one or two sharp up-and-down shakes, or by centrifuging. Avoid drawing off of the chloroform layer, thus obviating the washing of the chloroform extract.

B-2.3 Transfer the extract to a porcelain dish, rinse the container several times with a small quantity of chloroform and evaporate at room temperature in a current of dry air. Alternately, transfer it into an Erlenmeyer flask and dry slowly to one quarter of its volume. Transfer it to the dish, rinsing the flask with a small amount of chloroform and evaporate to dryness at room temperature in a current of dry air. Dry the residue overnight in a desiccator containing concentrated sulphuric acid.

B-2.4 Dissolve the residue in 30 to 50 ml of ethyl alcohol, and add 10 ml of water and one or two drops of phenolphthalein indicator solution. Titrate this solution with the standard sodium hydroxide solution and note the volume of sodium hydroxide.

*Specification for rectified spirit (*revised*).

B-3. CALCULATION

B-3.1 Benzoic acid, parts per million $= 61\,000\,000 \times \frac{NV}{V_1 W}$

where

N = normality of the standard sodium hydroxide solution;
V = volume of standard sodium hydroxide solution;
V_1 = volume of filtrate taken (**B-2.2**); and
W = weight in g of the material.

APPENDIX C

(*Clause* 4.5)

DETERMINATION OF THE GRADE OF THE PRODUCT

C-1. APPARATUS

C-1.1 White Porcelain Bowls — big enough to hold the contents of the container under examination.

C-1.2 Stainless Steel Spoons — table spoons.

C-2. PROCEDURE

C-2.1 Panel of Judges — Grades of the product shall be judged by a panel of three to five judges. All the judges constituting a panel shall be conversant with the factors governing the quality of the product. The containers shall be opened and the contents poured separately into white porcelain bowls. Each judge shall independently examine the contents from each of the containers and indicate scores for different characteristics.

C-2.1.1 The judges shall consider the following characteristics: colour and texture; taste and flavour; and absence of defects.

C-2.2 System of Scoring — The variations within each factor are so described in Table 2 that the scores may be ascertained for each factor and expressed numerically. The relative importance of each factor has been expressed numerically on a scale of 100. Each judge shall indicate the score for the individual factors, by the method described in Table 2, and record his observations in the Score Sheet (*see* P 11).

TABLE 2 METHOD FOR GIVING SCORES FOR MANGO CHUTNEY

(*Clause* C-2.2)

Organoleptic Characteristic	Description	Maximum Number of Points
(1)	(2)	(3)
Colour and texture	Good, practically uniform colour; fleshy texture, not at all fibrous	25
	Not quite uniform colour, slightly varying shades of the characteristic colour; slight discolouration	19
	Not very uniform; reasonably varying shades of characteristic colour; some discolouration	16
	Black colour; non-uniform; total discolouration	0
Taste and flavour	Pleasant aroma and taste characteristic of the product; free from objectionable or off-taste smell or odour	50
	Slight variation in normal flavour; taste characteristic, but tending to be slightly bitter	37
	Flat and somewhat dull taste; slightly objectionable smell	33
	Objectionable taste; offensive smell	0
Absence of defects	Free from defects, such as stone or scrapings, grit and other extraneous material	25
	One or two pieces of stone or scraping, a stray piece of extraneous material	19
	A few pieces of stone and scrapings, which may be gritty to feel	16
	Gritty, lot of extraneous material, pieces of stone and scraping	0

C-2.2.1 The scores as number of points indicated by the judges for the contents of each container for the three factors (*see* **C-2.1.1**) shall be in a tabular form in the Score Card (*see* P 12), and the average score calculated for each factor with overall average for each container entered in the appropriate column (*see* Table 2 and **C-2.3.2**).

C-2.3 Ascertaining the Grade

C-2.3.1 *Consistency Among Judges* — To ascertain the consistency of judgement among the judges, the total score indicated by each of them for the contents of the same container shall be calculated by adding up the score for the various individual characteristics. If the difference between the maximum and the minimum of the total scores so obtained does not exceed ($K + 5$), where K is the number of judges, the scoring shall be deemed as consistent for the container under consideration. If the difference exceeds ($K + 5$), the score that is farthest from its immediate neighbour (the scores being arranged in one order) shall be discarded and the consistency among the remaining judges shall be examined.

SCORE SHEET FOR INDIVIDUAL JUDGE

Sample No. .....

Date of Sampling .....

DETAILS OF THE SAMPLE: a) Product ..... b) Name of Manufacturer ..... c) Type .....
d) Batch No. ..... e) Date of Manufacture .....

Sample Cans

Factors	Score Points		1	2	3	4	5	6	7	8	9	10	
Colour and Texture	Grade 1	19 — 25											
	Grade 2	16 — 18											
Taste and Flavour	Grade 1	37 — 50											
	Grade 2	33 — 37											
Absence of Defects	Grade 1	19 — 25											
	Grade 2	16 — 18											

Signature of the Judge .....

Date .....

SCORE CARD

Sample Number .....

Date of Sampling .....

DETAILS OF THE SAMPLE CAN: a) Product ..... b) Name of Manufacturer ..... c) Type .....
d) Batch No. ..... e) Date of Manufacture .....

Factor →	Colour and Texture					Taste and Flavour					Absence of Defects					Total Scores					Average Score for				Grade of the Can
Judge → / Can Number ↓	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	Colour and Texture	Taste and Flavour	Absence of Defects	Total	

C-2.3.2 When the consistency (*see* **C-2.3.1**) is thus established, the overall average scores indicated by judges whose scoring has been found to be consistent, shall be calculated for each container. The average score for each of the individual characteristic shall also be calculated by taking into account the corresponding scores as given by the same judges for the contents of the same container.

C-2.3.3 *Assignment of Grade* — In order to assign a grade for the contents of a container, the following procedure shall be adopted.

For Grade 1 — The score for each factor individually shall be not less than 75 percent of the maximum score obtainable, and the overall average score shall be not less than 85 points.

For Grade 2 — The score for each factor individually shall be not less than 65 percent of the maximum score obtainable, and the overall average score shall not be less than 75 points.

APPENDIX D

[*Table* 1, *Item* (iii)]

DETERMINATION OF TOTAL ASH

D-1. PROCEDURE

D-1.1 Weigh accurately about 2 g of the material in a tared porcelain, silica or platinum dish. Ignite with the flame of a Meker burner for about one hour. Complete the ignition by keeping in a muffle furnace at 600° ± 20°C until grey ash results. Cool in a desiccator and weigh. Ignite the dish again in the muffle furnace for 30 minutes, cool and weigh. Repeat this process until the difference in weight between two successive weighings is less than 1 mg. Note the lowest weight.

D-1.2 Reserve the dish containing this ash for the determination of acid insoluble ash (*see* **E-2**).

D-2. CALCULATION

D-2.1 Total ash (on moisture-free basis), percent by weight

$$= \frac{100\,(W_2 - W)}{(W_1 - W)}$$

where

W_2 = the lowest weight in g of the dish with the ash;

W = weight in g of the empty dish; and

W_1 = weight in g of the dish with the dried material taken for the test.

APPENDIX E

[*Table* 1, *Item* (iv)]

DETERMINATION OF ACID INSOLUBLE ASH

E-1. REAGENT

E-1.1 Dilute Hydrochloric Acid — approximately 5 N, prepared from concentrated hydrochloric acid (*see* IS : 265-1962*).

E-2. PROCEDURE

E-2.1 To the ash contained in the dish (*see* **D-1.2**), add 25 ml of dilute hydrochloric acid; cover with a watch-glass and heat on a water-bath for 10 minutes. Allow to cool and filter the contents of the dish through a Whatman filter paper No. 42 or its equivalent. Wash the filter paper with water until the washings are free from the acid and return it to the dish. Keep it in an electric air-oven maintained at 135° ± 2°C for about 3 hours. Ignite it in a muffle furnace at 600° ± 20°C for one hour. Cool the dish in a desiccator and weigh. Ignite the dish again in the muffle furnace for 30 minutes, cool and weigh. Repeat this process until the difference in weight between two successive weighings is less than 1 mg. Note the lowest weight.

E-3. CALCULATION

E-3.1 Acid insoluble ash (on moisture-free basis), percent by weight $= \dfrac{100\,(W_2 - W)}{W_1 - W}$

where

W_2 = the lowest weight in g of the dish with the acid insoluble ash;

W = weight in g of the empty dish; and

W_1 = weight in g of the dish with the dried material (*see* W_1 in **D-2.1**).

*Specification for hydrochloric acid (*revised*).

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	*Unit*	*Symbol*	*Conversion*
Force	newton	N	1 N = 1 kg.1 m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

INDIAN STANDARDS INSTITUTION

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 26 60 21, 27 01 31 **Telegrams : Manaksanstha**

Regional Offices:		Telephone
Western : Novelty Chambers, Grant Road	BOMBAY 400007	37 97 29
Eastern : 5 Chowringhee Approach	CALCUTTA 700072	23-08 02
Southern : C. I. T. Campus, Adyar	MADRAS 600020	41 24 42
Branch Offices:		
'Pushpak', Nurmohamed Shaikh Marg, Khanpur	AHMADABAD 380001	2 03 91
'F' Block, Unity Bldg, Narasimharaja Square	BANGALORE 560002	2 76 49
Gangotri Complex, Bhadbhada Road, T.T. Nagar	BHOPAL 462003	6 27 16
22E Kalpana Area	BHUBANESHWAR 751014	5 36 27
Ahimsa Bldg, SCO 82-83, Sector 17C	CHANDIGARH 160017	2 83 20
5-8-56C L. N. Gupta Marg	HYDERABAD 500001	22 10 83
D-277 Todarmal Marg, Banipark	JAIPUR 302006	6 98 32
117/418 B Sarvodaya Nagar	KANPUR 208005	8 12 72
Patliputra Industrial Estate	PATNA 800013	6 28 08
Hantex Bldg (2nd Floor), Rly Station Road	TRIVANDRUM 695001	32 27

Reproduced by Reprography Unit, ISI, New Delhi